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NUCLEATION AND THE AUDIO-LINGUAL APPROACH.

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IN THE PRE-NUCLEATION STAGE, THE STUDENT IS CONCERNED WITH STORING, OR INTERNALIZING, THREE KINDS OF LANGUAGE PATTERNS--(1) ONE REPRESENTING THE SOUND STRUCTURE, (2) ANOTHER INVOLVING A PORTION OF THE SYNTACTIC STRUCTURE, AND (3) A THIRD--CALLED SANDHI VARIATION--ARISING FROM THE ACCIDENTAL CO-OCCURRENCE OF CERTAIN SOUNDS MAKING UP THE ELEMENTS OF SYNTACTIC CONSTRUCTIONS. "SANDHI" (SOUNDS LIKE SUNDAY) MEANS "A PLACING TOGETHER." THIS PHENOMENON INVOLVES THE INTRUSION OR THE DROPPING OF ONE OR MORE SOUNDS WHEN TWO FORMS CO-OCCUR IN THE SAME CONSTRUCTION. ALTHOUGH THE USE OF DIALOGUES AND PATTERN PRACTICE EXERCISES MAKES IT POSSIBLE TO VOCALIZE AND EVEN ANALOGIZE TO A FAIRLY HIGH DEGREE, IT IS FAR LESS SUCCESSFUL IN THE AREA OF AUDIO-COMPREHENSION. THE ASSUMPTION THAT A MARKED IMPROVEMENT IN SPEAKING WILL RESULT IN A CONCOMITANT IMPROVEMENT IN LISTENING--IF NOT IN READING AND WRITING--IS NOT NECESSARILY BORNE OUT. REAL MASTERY OF A FOREIGN LANGUAGE INVOLVES SEVERAL SUCCESSIVE BREAKTHROUGHS, EACH OF WHICH IS FOLLOWED BY AN ACCELERATED SPURT OF LANGUAGE PROFICIENCY. THERE APPEAR TO BE AT LEAST THREE SUCCESSIVE PROFICIENCY LEVELS--THE PRE-NUCLEATION STAGE, THE POST-NUCLEATION STAGE, AND THE MASTERY STAGE. THE PRIMARY OBJECTIVE RIGHT NOW SHOULD BE TO PROVIDE THE RIGHT MATERIALS AND THE RIGHT LEARNING CONDITIONS WHICH WILL ENABLE THE LANGUAGE STUDENT TO REACH THE POST-NUCLEATION STAGE. WHAT IS ADVOCATED IS NUCLEATION FIRST, THEN NEAR-NATIVE LISTENING AND READING COMPREHENSION. THE POST-NUCLEATION EMPHASIS ON COMPREHENSION HAS OTHER IMPLICATIONS. IN THE CASE OF READING, THE USE OF AN ENGLISH CRUTCH FAVORS A SMOOTHER TRANSITION TO LIBERATED READING THAN THE "HUNT AND PICK" METHOD, WHICH IS CLOSER AKIN TO PUZZLE SOLVING. IN ITS PRESENT STAGE OF DEVELOPMENT, THE AUDIOLINGUAL APPROACH IS FAR MORE LINGUAL THAN IT IS AUDIO. THE MOST UNDER-ESTIMATED AND LEAST UNDERSTOOD ASPECT OF FOREIGN LANGUAGE LEARNING TODAY IS AUDIO-COMPREHENSION. THIS DOCUMENT IS A REPRINT FROM "THE MODERN LANGUAGE JOURNAL," VOLUME 49, NUMBER 8, DECEMBER 1965, PAGES 482-491. (AUTHOR)

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Nucleation and the Audio-Lingual Approach

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NEW key procedures have been incorporated in the aural-oral approach, the audio-lingual method, and several similar methods that employ dialogues and pattern practice exercises to teach a foreign language. Each of these approaches or methods supposedly makes it possible for the language learner to internalize the grammatical structure of a language after engaging in intensive practice of dialogues and pattern drills. The theory assumes that once the student has "thoroughly" learned certain constructions, which have been seeded as basic sentences or frames in the dialogues and pattern drills, he

will be able to control—i.e., to understand and speak—the foreign language.[1]

It is true that students are capable of manipulating drills and memorizing dialogues to a very high degree of proficiency. Yet despite the ease with which they perform in this area, not many students can understand and speak the language *outside the ordinary classroom situation*. If one considers the grammatical principles underlying the pattern drills of any commercial audio-lingual textbook, it will be seen that they are not markedly different from the grammatical principles utilized in the grammar translation method. The method of presentation is different but the kind of structure taught is essentially the same: use of the indicative and subjunctive in dependent clauses, sequence of tenses in conditional clauses, forms and use of relative pronouns, subordinating conjunctions, and so forth. At one and the same time, such principles represent "too much" language and "not enough" language for the foreign language learner. On the one hand, the grammar is too "shallow": it does not reflect the essential structure of the language. On the other hand, it is too "extensive": it represents an area too broad in scope to permit internalization of the underlying principles.

To be sure "mastery" of the language presupposes control of this kind of structure. But mastery of the language is a *terminal not an immediate* objective, and the teaching of these and similar grammatical principles before the nucleation stage makes the acquisition of true audio-lingual skills very difficult. The term "nucleation" as applied to language learning was introduced by Kenneth L. Pike.[2] We quote the central theme of his article: "When a droplet is condensed out of a gas, or when a crystalline solid is precipitated out of a liquid, nucleation has occurred. Nucleation is involved in the first small clustering of atoms or molecules—say the first two or three dozen—into a structural pattern which will then be extensively duplicated in a repetitive pattern to form a crystal. It is difficult to get these first molecules to clump together. . . . Yet once nucleation has begun, growth may proceed with great rapidity. . . . Thus it appears that the energy barrier opposing nucleation is much greater than that opposing growth. The initial formation of starting nuclei is very difficult. The growth of these nuclei into larger units is very rapid and relatively easy and simple."[3]

Pike applies the principle of nucleation to language learning as follows: "Some persons have memorized long lists of vocabulary items, and even extensive rules of grammar, without being able to speak the language. One might say that their learning is in a supersaturated condition, without nucleation. That is, though they may have many of the elements necessary for a conversation, they cannot in fact handle these. Specifically, they lack the *structure*, the "crystallization"—which gives a characteristic patterning to sentences and conversations."[4]

In the report entitled "The Continuum: Listening and Speaking," of the 1963 Northeast Conference on the Teaching of Foreign Languages, we tried to point out the futility of presenting "too much structure" in the initial stages of language learning.[5] Since most "intermediate" language learning involves a review of "elementary" language learning, it should be obvious that the so-called intermediate level is primarily concerned with reteaching what we, as teachers, fail to teach earlier. Foreign language instruction today is defined as subject matter covered in academic year blocks rather than in terms of actual achievement. The learning of a language can only be envisaged as a progression—where certain structural features are internalized before others. Control of even the minimal structure is not guaranteed by memorization of a totally comprehended dialogue or the skillful manipulation of a pat-

[1] Simon Belasco, editor, *Applied Linguistics, French, German, Italian, Russian, Spanish*, Boston: D. C. Heath and Co., 1961, p. xi.

[2] Kenneth L. Pike, "Nucleation," *The Modern Language Journal*, Vol. XLIV, No. 7 (November 1960), pp. 291–295.

[3] Ibid., p. 291.

[4] Ibid., p. 291.

[5] Simon Belasco *et al.* "The Continuum: Listening and Speaking" in *Reports of the Working Committees, 1963 Northeast Conference on the Teaching of Foreign Languages*, pp. 3–21.

tern drill. This kind of oral behavior we have called "vocalizing."[6]

In fact the characterization of language as a set of "verbal habits" has been seriously questioned by Noam Chomsky and, as he points out, by philosophers and linguists dating back to the Seventeenth Century.[7] His position is that "rote recall is a factor of minute importance in ordinary use of language."[8] Chomsky quotes H. Paul (1886) as affirming that "a minimum of the *sentences* which we utter is learned by heart as such—that most of them, on the contrary, are composed on the spur of the moment. . . ."[9] Again, Cordemoy, a follower of Descartes, asserts that "the words which I hear utter'd by Bodies, made like mine, have almost never the same sequel. . . . to speak, is not to repeat the same words, which have struck the ear, but to utter others to their purpose and suitable to them."[10] In fact, the realization that this 'creative' aspect of language is the essential characteristic of language prompts Chomsky to dismiss summarily the notion that knowledge of one's language is reflected directly in linguistic habits and dispositions, and he posits that "speakers of the same language or dialect may differ enormously in dispositions to verbal response, depending on personality, beliefs, and countless other extra-linguistic factors."[11]

We are not advocating that dialogues and pattern drills be abandoned, nor are we suggesting along with Chomsky that language necessarily lies outside the domain of "verbal behavior." We are in complete agreement, however, with the tenet that the "creative" aspect of language *is* its essential characteristic. The emphasis here is on the word "creative," which implies that the language learner can recognize and produce *new* sentences, theoretically infinite in number. This type of linguistic experience we have called "analogizing."[12] It also implies an ability on the part of the learner to recognize and reject non-sentences. This type of linguistic activity we have called the awareness and rejection of "unacceptable analogizing."[13] To illustrate: on the model of *She is writing it to him*, a native speaker of English will both recognize and produce sentences such as *She is sending it to him, She is telling it to him, She is saying it to him*, etc. This is acceptable analogizing. The same speaker will also recognize and produce sentences such as *She is writing him to do it, She is sending him to do it, She is telling him to do it*, but will reject as a non-sentence **She is saying him to do it.* This is what is meant by the recognition and rejection of unacceptable analogizing. No current theory of language teaching attempts to do this in any systematic way.

It is as if the native speaker has a built-in monitor that performs two functions. In one instance, the monitor compares an incoming utterance with other utterances in its memory-bank and assigns to it a structural description if it is well-formed. In other words, the monitor accepts the utterance if it patterns with one of the utterances in its memory-bank. Otherwise it rejects it as a non-sentence. Something like this happens in listening comprehension and reading comprehension. In the other instance, the monitor scans the utterances in the memory-bank for a structural description that can be assigned to certain words selected by the speaker, which will enable him to convey a desired meaning. Something like this happens in speaking and writing. In both instances, if the patterns are not already stored in the memory-bank, then the monitor is in no position to assign a structural description to an utterance, whether the speaker is in the act of receiving or sending. Now the foreign language student brings his built-in equipment to the learning situation with him. The monitor is expected to separate all the foreign language patterns from the native patterns with a minimum of interference. If the foreign language gram-

[6] Ibid., p. 4.

[7] Noam Chomsky, "Current Issues in Linguistic Theory," in J. A. Foder and J. J. Katz, *The Structure of Language*, Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1964, pp. 50–118.

[8] Ibid., p. 51.

[9] Ibid., p. 51: H. Paul. *Prinzipien der Sprachgeschichte*, 2d ed., 1886. Translated into English, London: Longmans, Green and Co., 1890.

[10] Ibid., p. 51: G. de Cordemoy. *A Philosophicall Discourse Concerning Speech.* Translated from the first edition (1667), 1668.

[11] Ibid., p. 52.

[12] S. Belasco *et al.*, p. 9.

[13] Ibid., pp. 10–11.

mar is too shallow, so that some of the basic sound and syntactic patterns have been omitted, then the monitor has only the student's native patterns to work with. The same is true when the grammar is too extensive. If too many different patterns have been presented and relatively few have been stored in the memory-bank, the monitor still has very little to work with. On the other hand if the memory-bank contains those language essentials that can resist deterioration as new structural, lexical, and contextual pressures are added, then a structural stockpile can be built up—and the monitor can then be functionally operative.

In the pre-nucleation stage, the student is concerned with storing, or internalizing, three kinds of patterns: (1) one representing the sound structure, (2) another involving a portion of the syntactic structure, and (3) a third—called sandhi variation—arising from the accidental co-occurrence of certain sounds making up the elements of syntactic constructions. "Sandhi" (sounds like *Sunday*) means "a placing together." This phenomenon involves the *intrusion* or the *dropping* of one or more sounds when two forms co-occur in the same construction. For example, the consonant /z/ is intruded when *les* /le/ occurs before *aigles* /ɛgl/ in the construction *les aigles* /lez ɛgl/. The vowel /ə/ is dropped when *le* /lə/ occurs before *aigle* /ɛgl/ in the construction *l'aigle* /l ɛgl/. In French, sandhi variation is represented mostly by "liaison" or "elision," either of which may be obligatory (*obligatoire*), optional (*facultative*), or forbidden (*interdite*). Thus the constructions *les aigles* /lez ɛgl/ and *les zèbres* /le zɛbr/ have the *same sound structure* represented by the same sequence of consonants and vowels: CVCVCC—and the *same syntactic structure* represented by the same parts of speech: definite article plus noun. Therefore the two constructions manifest one pattern on the sound structure level and one pattern on the syntactic structure level. However, the two constructions do not manifest a pattern on the sandhi variation level. Only *les aigles* /lez ɛgl/ shows sandhi variation—(the intrusion of the sound /z/ when the two words co-occur)—since in isolation the two words would be pronounced /le/ and /ɛgl/. The construction *les zèbres* /le zɛbr/ does not show this kind of intrusion since the sound /z/ is always pronounced in the word *zèbre* /zɛbr/—whether it occurs after a word like *les* /le/ or not.

In the same way, the constructions *ils appellent* /ilz apɛl/ and *ils entendent* /ilz ātād/ manifest a sandhi variation pattern, whereas the constructions *ils s'appellent* /il s apɛl/ and *ils s'entendent* /il s ātād/ do not!

In French, obligatory liaison and optional elision affect the audio-lingual skills differently. For example, it is possible for the student who has been trained in the "classical" audio-lingual tradition to recognize and understand in context forms he has never heard before, but he will not be able to control them until they are an integral part of his structural stockpile. This is the case when the student has not been formally exposed to such prenominal adjective forms as the pre-vocalic masculine singular ending "t" in *grand homme* /grāt ɔm/, "z" in *gros effet* /groz efe/, "m" preceded by a denazalized vowel in *plein hiver* /plɛn iver/, and so forth. Evidently, there is sufficient patterning in the monitor's memory-bank for the student to recognize these constructions in context, but not enough for him to use them in speaking. The converse is true concerning cases of optional elision. There is sufficient patterning in the memory-bank for the student to pronounce and be understood when he utters all the "mute e's" in the construction *je te le redemanderai* /ʒə tə lə rədəmādəre/, but he will have difficulty understanding /ʒtəlrədmādre/ if he hasn't acquired a "state of expectancy" for this kind of elision.

If dialogues are to be used in an audio-lingual course, they must contain natural native speech. The purpose here *is not* to teach students to use colloquial or substandard forms. In fact, he should be discouraged from using them. And though he may never use them, he must learn to understand them. Otherwise, his potential for conversing with native speakers will be seriously limited. Native speakers of a language tend to omit all but the important elements of an utterance in normal conversation. André Martinet has pointed out that this principle was known to

such grammarians as Henry Sweet, Otto Jespersen, and Paul Passy at the end of the last century.[14] Passy's thesis—although concerned with historical phonological change—is very pertinent to the principle of internalizing both obligatory and optional sandhi variation patterns: "1. Le langage tend constamment à se débarrasser de ce qui est superflu. 2. Le langage tend constamment à mettre en relief ce qui est nécessaire. . . . Bien entendu . . . il n'est pas question de conservation volontaire des éléments superflus. Si je néglige un élément important, on ne me comprend pas, je me corrige, et sans doute j'exagère; si je néglige un élément superflu, on me comprend bien, et je recommence. Voilà tout."[15] Omission of redundant elements, retention of important elements, these are the characteristics of normal speech.

The student is never a nucleated language student until he has completely mastered the sound patterns, the sandhi variation patterns, and the basic syntactic patterns. For French the basic grammatical patterns involve little more than the internalization of the regular *-er*, *-ir*, and *-re* verbs and the irregular verbs *être*, *faire*, *aller*, *avoir*, *pouvoir*, and *vouloir* in the present tense, future tense, and the *passé composé*. To this add a limited vocabulary of about 1,000 roots. When he can reconstitute acceptable utterances based on these patterns so that they are readily understood by a native speaker, then he has reached the nucleation stage for speaking. When he can understand at normal speed any recombination of these verb forms and vocabulary items in the same (or similar) syntactic structures he has learned to control orally, he will have reached the nucleation stage for audio-comprehension.

Unfortunately, the audio-lingually trained student, as he goes on to higher levels of foreign language learning, is not always equipped with a solid structural stockpile,—reflecting internalization of the three types of patterning. The sound patterns tend to be slighted, and all but a few sandhi variation patterns are disregarded. Now if conversation is the aim of the audio-lingual approach, it will have to devote much more attention to listening comprehension than it has up to the present time. Conversation is a two-way street. It subsumes both sending and receiving. And if it is possible to send without complete mastery of the sound patterns, it is impossible to receive without complete mastery of the obligatory and optional sandhi variation patterns. And just because a student can utter a lot of sentences in a foreign language is no guarantee that he will understand them in the mouth of a native speaker.

Although the use of dialogues and pattern practice exercises makes it possible to vocalize and even analogize to a fairly high degree, it is far less successful in the area of audio-comprehension.

It is possible to develop acceptable speaking ability and yet virtually ignore listening comprehension. For example, during the two academic year French institutes held at Pennsylvania State University in 1960–61 and 1961–62, participants took the uniform pre-institute and post-institute MLA language proficiency tests for teachers as prescribed. A comparison of the 1960–61 average speaking scores of the Penn State participants with those of the All-French Institute participants—which include all French academic year institutes, French summer institutes abroad, and French summer institutes in the States—reveals the following:

TABLE 1
1960–61 MLA SPEAKING SCORES

	Penn State Average	All-Institute Average
Pre-test	171.0476	178.3758
Post-test	218.3684	181.5057
Improvement	47.3208	3.1301

The Penn State average speaking score shows an improvement of 47+ points, whereas the All-Institute national average shows an improvement of only 3+ points.

TABLE 2
1961–62 MLA SPEAKING SCORES

	Penn State Average	All-Institute Average
Pre-test	78.0455	78.5131
Post-test	91.3182	84.0142
Improvement	13.2727	5.5011

[14] A. Martinet, *Economie des changements phonétiques*, Berne, 1955, p. 42.

[15] Ibid., pp. 42–43.

Unfortunately, the scales and ranges of the MLA tests were changed the following year 1961–62 so it is not possible to get a clear picture of how the scores compare with those of the preceding year 1960–61. However, the improvement in speaking for the Penn State participants is still more than twice as great as that of All-Institute participants.

It is interesting to note, however, that improvement in the other skills: listening comprehension, reading, and writing for Penn State and All-Institutes is significantly lower than that of the Penn State *speaking* score. To illustrate this point, we cite the average difference in improvement of the post-test scores over the pre-test scores in the four skills for the year 1961–62.

TABLE 3
1961–62 MLA SCORES

	Penn State French Institute Mean Post-test Pre-test Difference	All-French Institute Mean Post-test Pre-test Difference
1. Speaking	+13.2727	+5.5011
2. Listening	+ 4.4091	+3.2730
3. Reading	+ 5.7273	+2.0761
4. Writing	+ 7.7273	+1.2429

Thus the assumption that a marked improvement in speaking will result in a concomitant improvement in listening—if not in reading and writing—is not necessarily borne out. In fact, it is possible to make a high improvement score in speaking, and make little or no improvement in listening, reading, and writing. This is evident from the following average differences between the Penn State post-test and pre-test scores of the first French Institute held in 1960–61.

TABLE 4
1960–61 MLA SCORES

	Penn State French Institute Mean Post-test Pre-test Difference
1. Speaking	+47.3208
2. Listening	+ 2.5039
3. Reading	+ 4.3913
4. Writing	+ 2.0435

It would seem then that each skill must be developed separately. Nucleation for speaking does not guarantee nucleation for audio-comprehension. Whether the converse is true still has to be determined by controlled experimentation. An attempt to deal with each skill separately was made in the second Penn State Institute 1961–62. A comparison of the post-test pre-test difference scores of both Penn State institutes for listening, reading, and writing reveals the following:

TABLE 5

	1960–61 Penn State MLA Post-test Pre-test Difference Scores	1961–62 Penn State MLA Post-test Pre-test Difference Scores
1. Listening	+2.5039	+4.4091
2. Reading	+4.3913	+5.7273
3. Writing	+2.0435	+7.7273

For these three skills, apparently the second institute showed greater improvement for writing, reading, and listening in that order. Traditional methods were used to improve these skills, but no skill improved to the degree *speaking* improved in either of the two institutes. Since then, some very sketchy pilot experimentation with reading materials and sandhi variation patterns points to greater improvement in both reading and audio-comprehension. However, good results were obtained only with students who, for all practical purposes, must be considered already "nucleated." This suggests that real mastery of a foreign language involves several successive breakthroughs, each of which is followed by an accelerated spurt of language proficiency. There appear to be at least three successive proficiency levels: (1) the pre-nucleation stage, (2) the post-nucleation stage, and (3) the mastery stage. After the first breakthrough is made, the student is in the post-nucleation stage. After the second breakthrough, he is in the mastery stage. Our primary objective right now should be to provide the right materials and the right learning conditions, which will enable the language student to reach the post-nucleation stage.

It must be noted that we are not advocating

comprehension first. We are advocating nucleation first, then near-native listening and reading comprehension. The pre-nucleation stage is concerned with the internalization of the basic system, which subsumes control of the sound patterns, the sandhi variation patterns, and the fundamental syntactic patterns. The post-nucleation stage is concerned with the development of a high degree of skill in listening and reading, which subsumes recognition and understanding of complex patterns. In the post-nucleation stage, the student already controls what he has practiced in the pre-nucleation stage. And in the mastery stage, he controls what he has practiced in the post-nucleation stage. In other words, what a student *practices* on one level, he must *actually control* on the next higher level.

The number of grammatical principles treated in the average commercial textbook is too large for the pre-nucleation stage and too small for the post-nucleation stage. Moreover, the problem lies not with the "number" of grammatical principles but with the "kind" of grammatical principles. A tagmemic analysis of the first two pages of a novel like Simone de Beauvoir's *Les Mandarins* makes this all too evident. No complete grammatical analysis—involving all the possible phonological, morphological, and syntactic structures—has ever been made for the commonly taught foreign languages such as French, German, Italian, Spanish, and Russian—let alone English. To suppose that a student can be formally and systematically exposed to all of the structure in the ordinary classroom situation is overly ambitious if not naïve. Our first duty then is to incorporate those structures into the audio-lingual program that will make it potentially possible for the student to effect nucleation. Our second duty is to make available to him certain self-pacing procedures, which will complement the foreign language instruction he receives in the classroom and the language laboratory. With respect to the first factor, the audio-lingual grammar has to reflect at least "descriptive adequacy"—to use a term coined by Chomsky.[16] Without dwelling on the potential contribution transformation principles can make to language learning today, let us by way of illustration indicate what the audio-lingual grammar should reflect in order to be descriptively adequate on the syntactic level. In French, the three sentences 1. *Le garçon embrasse la femme*, 2. *Le garçon obéit à la femme*, and 3. *Le garçon parle à la femme* are all sentences of the type noun phrase—verb—noun phrase in the active voice. The second noun phrase *la femme* functions as a direct object in the first sentence, but in sentences 2 and 3, *la femme* functions as a non-direct object. However, both sentences 1 and 2 can occur as transforms in the passive voice, but not sentence 3. In other words, one can say 1. *La femme est embrassée par le garçon*, and 2. *La femme est obéie par le garçon*. But no native speaker would accept 3. **La femme est parlée par le garçon*. Now this is obvious to native speakers of either French or English—for somewhat similar structural reasons. However, other constructions are not so obvious. Unless the pattern drills can account for all of the so-called "deep" grammatical structure, the student's analogizing may result in *"intuitively" unacceptable* forms. Both acceptable and unacceptable analogizing in the foreign language can result from inferences based on the patterns supplied by the foreign language structure and the native language structure. Let us note that a native French speaker will accept as grammatical the questions *Pourquoi Jean regarde-t-il?* and *Qui Jean regarde-t-il?* but not **Que Jean regarde-t-il?* He will accept *On a donné l'argent au garçon* and *L'argent a été donné au garçon* but not **Le garçon a été donné l'argent*. Nonetheless, a native English speaker is prone to make certain kinds of unacceptable analogizing. In the case of **Que Jean regarde-t-il*, he will have inferred it from the aforementioned questions introduced by *Pourquoi* and *Qui*. In the case of **Le garçon a été donné l'argent*, he will have inferred it from English structure, which permits such sentences as *The boy was given the money*. To be descriptively adequate, the audio-lingual grammar would have to set up a specific barrier against **Que Jean regarde-t-il* and **Le garçon a été donné l'argent* but not against the acceptable utterances. If the barrier cannot be built into the pattern practice exercises, then it must be

[16] Chomsky, *op. cit.*, pp. 62–79.

stated in the form of a grammatical generalization. However, if the audio-lingual grammar adequately reflects the deep structure of the utterances, including their transformational history, then it *will be* built into the grammar. A grammar that includes the two sentences *John is easy to please* and *John is eager to please* in a pattern drill—and stops there—is only concerned with surface structure.[17] A grammar that follows up with transformation exercises, where *John* in the first sentence but not in the second sentence can be shown to be "direct object" of *please* as in *To please John is easy* but not **To please John is eager*, is concerned with deep structure—and approaches descriptive adequacy. It is even more adequate when it shows that *John* can only be "subject" in the second sentence as *John is eager* and *John pleases*.

The other factor—that of making self-pacing procedures available to the student—is not so easily realizable. In the 1963 report, we suggested the use of a workbook to reinforce and help the student self-evaluate his language learning experience. At the same time we outlined a "team-teaching" procedure that would shift "the emphasis from covering a relatively indefinite amount of language within a definite period of time to assimilating a definite amount of language within a relatively indefinite period of time."[18] At that time, the basic course was divided into eight two-week periods, each of which was to be taught "live" by a teacher. At the end of each two-week period, a test determined whether a student should be shifted to the next higher learning unit. Only those students making an achievement score of 90% or better would be "shifted." Every student completing the course would necessarily receive the grade of A. Of course the time taken to complete the course would vary with each student.

We should like to suggest another possibility for self-pacing, wherein the time limit is kept constant but emphasis is still placed on achievement. We do not think it has the same potential as the team teaching method, but it offers more possibilities than the ordinary classroom method. The proposed method might be called the "progressive homogeneous grouping method" or the "track method." For example some 120 language students—randomly selected—might make up 5 classes of beginning French. About 24 students would be in each class. After the first two-week test, they would be regrouped according to five tracks I, II, III, IV, and V representing test scores ranging respectively from 100–90, 89–82, 81–74, 73–67, 66 and below. All the classes would be given at the same hour. Each of the five instructors would be assigned to a single track for at least one term. Let us suppose that the basic course would last for two terms, each term consisting of five two-week periods—or eight two-week periods if we consider the semester system of most high schools and colleges. Depending on their test scores, students will be shifted to different tracks after each two-week test. The tests for students in all five tracks would be identical. A typical distribution of the students in the five tracks over the first term consisting of five two-week periods might be as follows:

[17] cf. Ibid., p. 66.
[18] cf. S. Belasco *et al.*, *op. cit.*, pp. 19–20.

TABLE 6

		Tracks I	II	III	IV	V		
1st two-week period	No. of students per 2-week unit	24	24	24	24	24	V	
	No. of students per 2-week unit	30	30	30	15	15	W	
	No. of students per 2-week unit	25	35	25	20	15	X	5 two-week periods
	No. of students per 2-week unit	25	30	30	20	15	Y	
	No. of students per 2-week unit	20	25	30	25	20	Z	

The teaching approach in the second term would be similarly structured. It will be noted that the distribution of the students in the five tracks at the end of the term approximates a bell-shaped curve. This is to be expected. But homogeneous grouping has certain advantages over the ordinary classroom approach. In the first place, it motivates the good students, and it is less of a morale destroyer for the poorer students than the regular approach. Secondly, it allows for individual differences and provides a better opportunity for self-evaluation and self-pacing. Homogeneous grouping was used in the pattern practice classes of the two Penn State institutes, and the results seemed to justify the use of the procedure.

And now a word or two about the post-nucleation stage, which would be specifically designed to accelerate reading comprehension and audio-comprehension. It will be remembered that at this stage, students would control the fundamental sound, sandhi variation, and syntactic patterns for speaking, listening, and reading. The theory implies that once the student is in the post-nucleation stage, a high degree of achievement in listening and reading will bring him closer to the "art of conversation" and real "mastery of the language" than a comparable degree of speaking. Without debating the dangers of using translation in an audio-lingual approach, let us outline the general technique for accelerating reading comprehension and audio-comprehension: Each student would receive a manual with the French text on the left-hand page, and the equivalent English translation on the right-hand page. For quick checking, there would be a reference vocabulary list, and notes in the back of the manual. Let us say that the comprehension course is made up of 10 units, and each unit is learned in 20 steps as follows:

Unit I.

step 1. Student reads the French and covers the English.
step 2. Student consults English equivalents only when he encounters difficulty.
step 3. Student compares structure of both languages, and refers to vocabulary and notes in the back if necessary
step 4. Student rereads French selection until he can understand it completely, without recourse to English text, vocabulary, or notes.
step 5. Student takes a reading comprehension test in French (questions and answers in French, supplemented by certain "spot" French to English translations).
step 6. If student does not score 100%, he checks his mistakes against the French-English texts until he can answer everything correctly.
step 7. Student hears the same selection in French only—read by native French speakers at normal speed (on tape).
step 8. Student may refer to the written French or English text if he encounters difficulty.
step 9. He relistens to the French tape until he understands it completely.
step 10. He takes a listening comprehension test in French (questions and answers in French), which is different from the reading comprehension test taken earlier.
step 11. If student does not score 100%, he checks the tape against the French-English text until he understands the French tape without any French or English "crutch."
step 12. Student now reads an entirely different selection in French for fluency—containing no new structures or vocabulary—but one that has the content of the original reading selection recast as a different story (no crutches).
step 13. Student takes a reading comprehension test in French as formerly described in step 5 above.
step 14. If student does not score 90%, he is given a French-English crutch.
step 15. Student goes through reading procedure as described in steps 1 to 6 above.
step 16. Student then listens to the second selection in French read at normal speed (no crutches).

step 17. Student takes a listening comprehension test in French as described in step 10 above.

step 18. If student does not score 90%, he checks tape against the French-English texts as in step 11 above.

step 19. Student now takes a "terminal" reading test on Unit I structures and vocabulary (third selection, different story, no crutches).

step 20. Student follows with a "terminal" listening test on Unit I structures and vocabulary (fourth selection, different story, no crutches).

All students that pass with a score of at least 80% go on to Unit II and go through the same procedure.

The post-nucleation emphasis on comprehension has other implications. In the case of reading, the use of an English crutch favors a smoother transition to liberated reading than the "hunt and pick" method, which is closer akin to puzzle solving. Even if it could be shown that the use of a crutch would produce results that are *as good as—if not better than*—the hunt and pick method, then why make our students wear this hair-shirt? In the case of audio-comprehension, true audio-comprehension, the acquisition of this skill may very well be the key to achieving a high degree of proficiency in the other skills. This would certainly be in the true spirit of the audio-lingual approach. And it would certainly be closer to reality. Immigrants may never learn to read or write, but they learn to speak a new language *after* they learn to understand it. Foreign language students learn to read, write, and speak a second language, but have difficulty understanding a film in that language if it doesn't have sub-titles. The same is true of foreign language students overhearing a conversation between two native speakers. In its present stage of development, the audio-lingual approach is far more lingual than it is audio. The most under-estimated and least understood aspect of foreign language learning today is audio-comprehension.